

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Hans-Christoph MAGEL
Based on : PCT/DE 03/01999
Title : DEVICE FOR SUPPRESSING PRESSURE WAVES IN
RESERVOIR INJECTION SYSTEMS
Docket No. : R.303662
Customer No. : 02119

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Date: March 14, 2005

**INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR 1.97(b),
AND EXPLANATION OF THE RELEVANCE OF THE CITED PRIOR ART**

Sir:

The undersigned hereby requests that the prior art cited on the attached prior art statement be placed of record in the application file and be considered by the examiner.

This citation of prior art is made under 37 CFR 1.97(b), since it is being filed within three months of the filing date and before the mailing of a first Office action.

The relevance of the prior art cited on the attached form 1449 is as follows:

US 5,392,749

This patent teaches a hydraulically-actuated injector fuel system with separate internal actuating fluid and fuel passages for an engine having an engine member such as a cylinder head. The hydraulically-actuated injector is positioned in an injector bore defined in the cylinder head. A hydraulically-actuated injector fuel system requires an apparatus for communicating fuel and actuating fluid to each injector. The present invention provides separate actuating fluid and fuel manifolds or passages which are internally disposed in the engine.

US 2002/0071768 A1

This patent teaches a pumping system with high pressure restriction for a fuel injection system. The system is comprised of a body defining a high pressure pumping chamber, a plunger, a high pressure outlet, a high pressure fluid line connecting the pumping chamber to the outlet, a control valve along the fluid line, and a valve and restriction arrangement along the fluid line. The valve and restriction arrangement includes a restriction and a valve body. The valve body is movable between an open position in which fuel flow from the pumping chamber is generally unrestricted by the restriction and a closed position in which fuel flow from the pumping chamber is significantly restricted by the restriction to store energy in the pumping chamber. Advantageously, the high pressure restriction concept may be utilized in a pumping system for various types of rate shaping, including boot

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injection and square injection, in addition to pilot operation and post injection operations, and others.

US 4,336,781

This patent teaches a liquid fuel injection pump snubber. The pump has a rotary distributor for unrestricted delivery of metered charges of fuel in succession to the fuel injection nozzles of an associated engine. The snubber orifice has a snubber port provided either in the distributor stator for each distributor outlet port or in the rotor for the distributor delivery port for transmitting and damping a reverse pressure wave from each fuel injection nozzle back through the distributor.

DE 199 39 425 A1

This patent teaches a fuel injection method for internal combustion engines. The method involves injection of fuel into the combustion chamber of an engine at two or more different pressures via injectors (10). Injection at the higher pressure is pressure-controlled and at least one lower fuel pressure is generated during the fuel injection by controlling a valve cross-section. An independent claim is also included for a fuel injection system. The fuel injection system has one local diversion unit for each injector, and the diversion unit can be activated or deactivated via a valve unit.

Appl. No. Unknown
IDS filed March 14, 2005
Prior to first Office Action

US 6,718,947 B1

This patent is in the same family as DE 199 39 425 A1 and is provided as an aid to the examiner.

DE 195 11 515 C1

This patent teaches a solenoid-valve-controlled fuel injector nozzle for internal combustion engines. A needle (2) surrounded on the nozzle side by a pressure chamber cooperates with a control piston in a control chamber (4). The fuel supply line (7) opens into the pressure chamber from a high-pressure connection (6) equipped with a spring-loaded non-return valve (18) in the form of a thick-walled disc. During the injection phase, the valve is lifted from its seating against the opposition of the spring, and allows unrestricted flow of fuel to the nozzle.

EP 1 217 202 A1

This patent teaches a pressure wave damping procedure consisting of creating a restriction in the hydraulic line (1), e.g. between a common manifold (2) and a fuel injector (3). The fuel injector has a very low flow height relative to the flow length or width. Each hydraulic line (1) incorporates a restrictor (5) operating in a thin layer flow mode and has a parallel non-return valve (6) opening in the manifold/injector direction.

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DE 196 40 085 C1

According to the teachings of this patent, a shut-off valve (8) prevents fuel flowing uncontrollably into an engine cylinder if the injection nozzles are defective. The valve has an actuator (14) which is movable in a valve chamber (15) between a closed and an inoperative position. In an intermediate position fuel flows through at least one throttle (24). A spring (13) biases the actuator to the inoperative position. The actuator has a closing head (23) with a pressure surface which, in the inoperative position, is acted upon by fuel pressure on the pump side over a partial surface (26) which is smaller than the total surface acted upon in the closed or intermediate positions. The surface sizes acted upon in the inoperative verses closed or intermediate positions are in a ratio such that, on starting, the actuator (14) is opened from the inoperative position only when a pressure is applied to the partial surface to move the actuator against the spring force. Thus the pressure needed to move the shut-off valve (8) out of the inoperative position is appreciably higher than that needed to move it out of the intermediate position.

GB 2 317 922 A

This patent is in the same family as DE 196 40 085 C1 and is provided as an aid to the examiner.

DE 199 10 970 A1

This patent teaches a fuel injection system (1) comprising a pressure intensifying unit (9) arranged between a pressure accumulation chamber (6) and a nozzle chamber (16). The

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pressure chamber (14) of the pressure intensifying unit is connected to said nozzle chamber (16) via a pressure line (20). In addition, a bypass line (28) is provided which is connected to the pressure accumulation chamber (6). The bypass line (28) is directly connected to the pressure line. The bypass line (28) can be used to effect pressure injection and is arranged parallel to the pressure chamber (14) so that the bypass line (28) can be passed through regardless of the movement and position of a displaceable pressure means (12) of the pressure intensifying unit (9). The inventive fuel injection system increases the versatility of injection.

US 6,453,875 B1

This patent is in the same family as DE 199 10 970 A1 and is provided as an aid to the examiner.

Examination of this application is respectfully requested.

Respectfully submitted,

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INFORMATION DISCLOSURE CITATION
(Use several sheets if necessary)

Docket Number (Optional)
R.303662

Application Number
10/527586

Applicant(s)
Hans-Christoph MAGEL

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Group Art Unit

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		5,392,749	02-28-1995	Alan R. STOCKNER et al			
		4,336,781	06-29-1982	Norbert W. OVERFIELD			
		6,718,947 B1	04-13-2004	Bernd MAHR et al			
		6,453,875 B1	09-24-2002	Bernd MAHR et al			

U.S. PATENT APPLICATION PUBLICATIONS

*EXAMINER INITIAL	REF	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		2002/0071768 A1	06-13-2002	Gregg R. Spoolstra et al			

FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	Translation	
							YES	NO
		DE 199 39 425 A1	03-01-2001	Germany			✓	
		DE 195 11 515 C1	08-22-1996	Germany				✓
		EP 1 217 202 A1	06-26-2002	European				✓
		DE 196 40 085 C1	04-02-1998	Germany			✓	
		GB 2 317 922 A	04-08-1998	United Kingdom			✓	

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, Etc.)*

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP Section 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	Translation	
							YES	NO
		DE 199 10 970 A1	09-28-2000	Germany			✓	

OTHER DOCUMENTS

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